

**Workshop on information needs to improve implementation
of diabetic retinopathy screening and treatment programs
for the elimination of avoidable blindness due to
diabetic retinopathy in India.**

**26th -30th March 2007
New Delhi, India**

Report: Clare Gilbert and GVS Murthy

Organized by:

The International Centre for Eye Health, London, UK, and the
Dr. RP Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, Delhi, India



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PURPOSE:

To increase knowledge and awareness of diabetes and diabetic retinopathy in India

To learn about current approaches to detecting and treating sight threatening diabetic retinopathy (STDR), and their advantages and disadvantages

To promote networking between organizations, agencies and individuals concerned with the control of visual impairment and blindness due to diabetic retinopathy

To identify and address information gaps in order to provide a road map of activities for control which can be taken up and incorporated into the 11th national plan for the control of blindness and implemented by the National Programme for the Control of Blindness (NPCB) with the support of VISION2020 India and implementing institutions and organizations.

EXPECTED OUTCOMES:

1. A situation analysis instrument and methodology for mapping infrastructure, human resources and equipment for the management of diabetic retinopathy (DR) in India
2. Methods for assessing the cost effectiveness of existing models
3. Identification of other information gaps in relation to policy or programme development, with outlines of guidelines on how they can be addressed (e.g. for training)
4. Identification of other information gaps, with outlines of studies to address them (e.g. operational / epidemiological / qualitative / health services research)

PARTICIPANTS

The workshop was attended by a wide range of participants, including ophthalmologists from all sectors of eye care delivery; diabetologists; public health physicians; community ophthalmologists; programme managers and representatives from the non-government sector. Dr Swamy, Mr. R.D.Thulasiraj and Miss Tanuja Joshi represented VISION2020 India. Dr. R.Jose (Deputy Director General, Ophthalmology), the national co-coordinator for the prevention blindness, was also in attendance. Dr. R.S.Dhaliwal represented the Indian Council for Medical Research.

WELCOME SESSION:

Participants were welcomed, and the scope, purpose and expected outcomes of the workshop were presented.

PLENARY SESSIONS:

During plenary sessions presentations were made which show that the prevalence and magnitude of diabetes is increasingly dramatically globally, and that India is particularly affected due to rapid development, ageing and life style changes. Population based studies also show that in India a high proportion of diabetics are unaware that they have the condition and remain undiagnosed.

There have been new developments in the management of diabetes, and in the management of risk factors (e.g. hypertension; hyperglycaemia) for the complications of diabetes (e.g. diabetic retinopathy, vascular and renal disease). A detailed population based study in an urban population in Chennai

suggests that rates of DR among diabetics are lower than in industrialized countries, which may be due to variation in susceptibility, or to higher mortality rates among those affected.

Presentations were also made on the management of DR. The mainstay of treatment of proliferative disease (PDR) remains peripheral pan-retinal laser photocoagulation, but there have been new developments in the treatment of clinically significant macula oedema and of late stage retinopathy. New treatments include intravitreal injections (which need to be repeated) of steroids and anti-VEGF agents: both require more sophisticated equipment for precise diagnosis, repeated injections and close follow up in the out patient department.

The principles underlying screening programmes were described i.e. screening programme should only be undertaken for conditions which are of public health importance, where the natural history is known, and where earlier treatment (i.e. at asymptomatic stages) gives better outcomes than waiting for patients to present with symptoms. Screening tests need to be valid (i.e. have high levels of sensitivity and specificity), safe and acceptable, and adequate services must be available for those needing further investigation to confirm the diagnosis, and for treatment. It is also important that screening programmes have high coverage (i.e. they are equitable), are ongoing (i.e. they should not be a "once off" activity), and are cost effective.

A range of eye care providers who are screening for DR in India, showing that many different models are being explored, the majority being within the NGO sector, made presentations. These can be divided into two broad approaches: mass screening and opportunistic case detection (Table 1).

Approach	Location	Components	Who "screening"	Screening tests	Confirm diagnosis + treat
Mass screening	Community	Dedicated for DR +/- screening for diabetes	Trained MLP	Digital images with remote/on the spot, real time grading	Base hospital
			Ophthalmologist	Ophthalmoscopy through dilated pupils	Base hospital
		As part of routine eye camps	Trained MLP	Digital images with remote/on the spot, real time grading	Base hospital
			Ophthalmologist	Ophthalmoscopy through dilated pupils	Base hospital
Opport- unistic case detection	Diabetic clinics		Trained MLP	Digital images with remote/on the spot, real time grading	Base hospital
			Physicians	Ophthalmoscopy through dilated pupils	Base hospital
			Ophthalmologist	Ophthalmoscopy through dilated pupils	Base hospital / outreach (PDR only)

Diabetic retinopathy fulfils all the criteria for screening programmes in relation to the disease and its management. However, participants did not consider mass screening to be appropriate in India at the moment because of competing demands for limited resources, logistical difficulties as there are only a limited number of registers of diabetics, and because facilities and personnel for diagnosis and treatment are currently inadequate.

PRIORITIZING INFORMATION NEEDS:

Workshop faculty drew up and presented a list of information gaps that had emerged during the plenary sessions and discussions (see Appendix 3), and participants worked in groups to identify other

information gaps, and to prioritize areas for subsequent group work. The priority areas that groups worked on during days 3 and 4 of the workshop are shown below.

Information needs	Group Leader
Awareness and health education strategy for the community	Miss E. Kurian
Awareness raising for health care workers	Dr P. Vashist
Training ophthalmologists	Dr C. Shetty
Situation analysis of human resources, infrastructure and equipment	Miss N. John
Guidelines for detecting DM and DR at each level of service delivery, integrated into the non-communicable diseases programme	Dr P. Gogate
Opportunistic screening guidelines	Dr K. Viswanath
Evaluation of current screening models (coverage; uptake of treatment; follow up; cost effectiveness etc)	Dr S. Rachapalle

On day 5 groups presented their work, for discussion and feedback.

OUTPUTS:

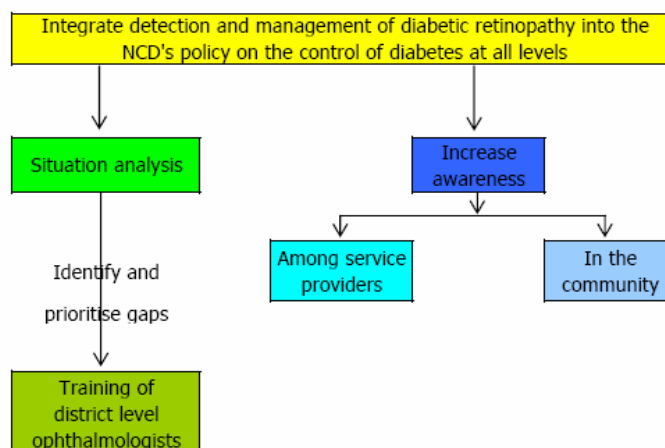
A key output of the workshop was a document outlining how the detection, investigation and management of DR could readily be incorporated into the health care system, by adapting the guidelines developed by the government's Non-Communicable Diseases (NCD) unit for the control of diabetes. The latter have already been adopted and are being implemented in five pilot districts across India.

Another group developed the methodology for a detailed situation analysis of services for the control of visual impairment due to DR. This situation analysis is urgently needed to identify gaps in the health care system where more trained personnel, equipment and infrastructure are needed. The training programme developed by another group provides the basis for expanding eye care delivery for DR, by giving ophthalmologists at the secondary level the skills necessary for the diagnosis and management of DR.

As mass screening programmes cannot be recommended at present there is a need to increase awareness in the community about diabetes and its complications so that those affected seek out eye care services on a regular basis. At the same time awareness and knowledge about DR needs to be increased amongst health care providers. Groups addressed both these issues during the workshop. Opportunistic "case detection" needs to increase so that diabetics have the opportunity for an eye examination at as many points of contact with the health care system as possible, and another group drafted guidelines to address this.

In the future mass screening may become a viable option, and another group designed a study to evaluate the model mass screening projects currently being supported and implemented by the NGO sector. This study will provide evidence of the efficiency and cost effectiveness of a range of different models which will be of value for policy makers and programme planners.

How the different outputs of the workshop fit together is shown below.



SOURCES OF INFORMATION AVAILABLE TO PARTICIPANTS:

Several organizations and institutions prepared posters which were displayed during the workshop, and more than 100 articles from scientific journal were made available for reference. All the presentations, and other materials were given to participants at the end of the workshop, burned onto CDs.

EVALUATION:

At the beginning of the workshop participants were requested to write down their expectations of the workshop. Visual analogue scales were used in the evaluation on the last day. Overall the workshop was found to be very useful, and exceeded expectations in many instances.

	Excellent	Good	Poor	Responded
Pre workshop information	77%	23%	-	13
Organization of the workshop	100%	-	-	13
Accommodation, food, hospitality	100%	-	-	13
Value of posters	100%	-	-	13
Value of publications available	100%	-	-	10
Expectations met	75%	25%	-	12
Plenary sessions Day 1	100%	-	-	10
Plenary sessions Day 2	70%	20	10%	10

Group work	Very valuable	Partially valuable	Useless
Deciding priorities	12 (92.3%)	1 (7.6)	-
Working in groups	12 (92.3%)	1 (7.6)	-
Presentations and discussions	13 (100%)	-	-

Suggestions for improvement:

- Published papers and reports to sent in advance for better preparation
- Give time for sight seeing or shopping
- Prefer shorter duration
- Better timing of plenary session talks

CONCLUSIONS AND RECOMMENDATIONS

Background:

As a result of ongoing support from the government of India, and increasing outputs from eye care services in all sectors, blindness due to cataract is declining in India. Services for refractive error, the second commonest cause of visual impairment and blindness, are also expanding. As VISION2020 enters its second phase, posterior segment diseases such as diabetic retinopathy and glaucoma are assuming greater importance in India. However, control of these diseases is more challenging, as for both conditions treatment is more effective at the early, often asymptomatic stages. Both conditions require more expertise and sophisticated equipment not only for early detection and subsequent diagnosis but also for management. There are more challenges as far as patients are concerned, as management is not once off (as with cataract) nor are the benefits of treatment immediately apparent.

The need in the population:

Conclusions:

- Diabetes is increasing dramatically in India, due to lifestyle changes, and the number affected is projected to increase from around 40 million to almost 80 million by 2030. Approximately 10-18% of diabetics have diabetic retinopathy, and 2-5% need laser for sight threatening disease
- The number of patients being treated for diabetic retinopathy is increasing in centres with the necessary facilities and expertise, suggesting that diabetic retinopathy is also increasing.

Recommendations:

- Participants at the workshop endorse the ICMR's plans to undertake a multi-centre, population based survey to determine the prevalence of diabetes, and of diabetic retinopathy and its risk factors (and ideally the incidence), which will provide the evidence base for planning and resource allocation.

Strategies for control of visual impairment due to diabetic retinopathy:

Conclusions:

- Detection and management of diabetes and diabetic retinopathy is currently inadequate.
- Several different models of mass screening and opportunistic case detection for diabetic retinopathy have been developed and are being used by service providers in the NGO sector. Mass screening for the detection of diabetic retinopathy among diabetics in the community cannot be recommended at present as this is resource intensive, coverage is limited, facilities for diagnosis and management are not adequate, and the proportion of diabetics with sight threatening retinopathy who attend eye units for diagnosis and treatment after referral is often relatively low.
- The unit of Non-Communicable Diseases (NCD) have developed guidelines for the detection and management of diabetes within the health care system, from the primary level through to the tertiary level of health care.

Recommendations:

- The detection and management of diabetic retinopathy needs to be incorporated into the current NCDs policy and plans for the detection and management of diabetes within the existing health care system (government, NGO and private sectors), at all levels of service delivery. It is recommended that the guidelines developed by participants at this workshop be adopted as a policy by the NPCB, and that operational research be undertaken, led by the NGOs, to assess the feasibility and cost in a limited number of districts in the first instance.
- That every opportunity for the detection of diabetic retinopathy among diabetics be undertaken by eye care providers, including during outreach and routine eye clinics, by examining diabetics in diabetic clinics and by encouraging referrals from physicians and endocrinologists who provide

services for diabetics. Comprehensive eye examinations should be the norm, particularly for individuals over the age of 40 years.

- Public private partnerships need to be strengthened and encouraged.
- Operational research is needed to evaluate current models of screening for diabetic retinopathy from the perspectives of coverage, uptake of treatment and cost effectiveness in order to provide evidence for policy development and programme planning by the government and NGOs.

Strategies to increase awareness

Conclusions:

- Awareness about diabetes, its risk factors and complications, is generally low among health care workers as well as the general population. This means that a very high proportion of diabetics (>20%) remain undiagnosed, and diabetics are not having regular eye examinations.

Recommendations:

- Awareness, knowledge and skills need to be increased among health care workers at each level of service delivery. It is recommended that the guidelines developed by participants at the workshop be adopted by the NPCB for implementation
- Strategies and programmes for increasing awareness in the community about diabetes and its complications, and to promote appropriate health seeking behaviour, need to be developed and evaluated. It is recommended that the pilot project developed by participants at the workshop be supported, to provide evidence of the effectiveness of health education interventions.

Human resources, infrastructure, equipment and advocacy:

Conclusions:

- The number of personnel with the necessary knowledge and skills for diagnosing and managing diabetic retinopathy at secondary and tertiary levels is currently inadequate, particularly in the Northern and Eastern States, and more information is needed for planning to fill the gaps.
- The NPCB has requested the government to support the strengthening of all levels of eyecare delivery within the 11th national plan.

Recommendations:

- To control visual loss due to diabetic retinopathy it is recommended that there be at least 1 ophthalmologists trained in diagnosing, investigating, and treating / referring patients with diabetic retinopathy per district, as well as at least one laser, in the first instance. Approximately 300 ophthalmologists need to be trained to reach this target.
- There should be at least one medical retina centre for every 5 million, and one centre providing vitreoretinal surgery for every 10 million population.
- A comprehensive, detailed situation analysis in relation to diabetic retinopathy needs to be undertaken across the country. This should include mapping human resources, equipment, infrastructure and training capacity as well as clinical activities and their output. This activity should include the government, NGO and private sectors. Participants at the workshop developed a detailed proposal for this situation analysis, as well as a study to investigate health seeking behaviour. It is recommended that the NPCB support this activity as a priority.
- Participants at the workshop developed a three month training programme for district level ophthalmologists, and it is recommended that this be endorsed and adopted by the NPCB once gaps in service provision have been identified and prioritized.
- Continuing professional development needs to be rolled out, with appropriate IEC support
- VISION2020 should take the lead in networking with all stake holders and advocate with the government of India and the Planning Commission to mobilize resources as and when required.

APPENDIX 2: Participants

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APPENDIX 2. Programme

26th March 2007

08.30 – 09.30	Registration	
09.30 – 10.30	Inaugural Session	
	Welcome Address	Clare Gilbert
	Inaugural Address	Dr. R.V.Azad
	Key Note Address	Dr. Nam
	Scope and Purpose of Workshop	Daksha Patel
	Introduction of participants & Administrative Announcements	Neena John
	The Diabetic epidemic: global and Indian issues-trends, risk factors, burden	Prof. Nikhil Tandon
	Vote of Thanks	Dr. P.K.M.Swamy
10.30 – 11:00	TEA	
11:00 – 13.00	Scientific Session I: Overview of Diabetes & DR: Chairperson: Dr. T.P.Das & Dr. H.K.Tewari	
20 mins	Recent advances in clinical management of diabetes	Prof. S.V.Madhu
10 mins	<i>Discussion</i>	
20 mins	Magnitude of diabetic retinopathy in India	Dr. Nam
20 mins	Risk factors for diabetic retinopathy	Clare Gilbert
20 mins	Clinical presentation in diabetic retinopathy	Dr. H.K.Tewari
10 min	The problem of Diabetic Retinopathy in India	Prof. S.Ghose
10 mins	<i>Discussion</i>	
13.00 – 13.45	LUNCH	
13.45 – 15.00	Scientific Session- II: Diabetes and the Eye: Chairperson: Dr. Nam & Dr. C.S. Shetty	
15 mins	Grading of diabetic retinopathy and its prognostic significance	Dr. Aartee Palsule
15 mins	Treatment of diabetic eye disease	Dr. K.S. Santhan Gopal
15 mins	Principles of screening for a disease and its relevance to diabetic retinopathy	GVS Murthy
15 mins	Sensitivity and specificity of different screening methods	Clare Gilbert
15 mins	Comparison of different screening personnel for diabetic retinopathy	Dr. P. Venkatesh
15.00 – 15.15	TEA	
15.15 – 17.15	Scientific Session III: Diagnostic criteria and screening tools: Chair: Dr R.V.Azad & Daksha Patel	
10 min	ORBIS support to DR programs in India	Dr G.V.Rao
15 mins	The optimal interval for screening for sight threatening retinopathy in diabetics	Daksha Patel
15 mins	Does opportunistic screening have a role in diabetic retinopathy?	Neena John
15 mins	Awareness of diabetes and diabetic eye disease in the community	R.D.Thulasiraj
15 mins	Diabetic retinopathy in a clinic setting & doctors' awareness: Dr. R.P.Centre	Dr R.V. Azad
15 mins	Round up of day's proceedings	Clare Gilbert

09.00 – 10.45	Scientific Session-IV: Successful approaches to screening for Diabetic Retinopathy : Chair: Dr. Santhan Gopal & Dr. C.S.Shetty	
15 mins	Screening for diabetic retinopathy in the UK: strengths and limitations	Dr. Larry Benjamin
15 mins	Screening program for sight threatening diabetic retinopathy: the Aravind Model	Dr. Nam
15 mins	Successful screening program in India: Sankara Netralaya Model	Drs. R.Sudhir& R.Raman
15 mins	Screening program and lessons learnt: Sarojini Devi Eye Hospital	Dr. K.Vishwanath
15 mins	L.V.P. Model for diabetic retinopathy	Dr. T.P.Das
15 mins	The National Program for Control of Blindness: plan for diabetic retinopathy	Dr. R.Jose
15 mins	<i>Discussion</i>	
11.00 – 11.15	TEA	
11.15 – 13.00	Scientific Session-V: Clinical interventions and screening for Diabetic Retinopathy: Chair: Dr.R.Jose & Elizabeth Kurian	
15 mins	DR Screening in Satellite Clinics: Venu Eye Hospital, New Delhi	Dr. Anil Tara
15 mins	Use of screening techniques for DR: Experience from SEWA-Rural	Dr. Uday Gajiwala
15 mins	Initiation of DR screening program at Gomabai Hospiital, MP	Dr. P. Dhobale
15 mins	Initiation of DR screening program at Netra Nirmay Niketan, West Bengal	Dr. J. Bhattacharya
15 mins	Multicentric study on Diabetic Retinopathy: H V Desai Eye Hospital, Pune	Dr. P.Gogote
15 mins	Diabetic retinopathy screening at Drashti Netralaya, Gujarat:	Dr. Mehul Shah
15 mins	<i>Discussion</i>	
13.00 – 13.30	LUNCH	
13.30 –14.45	Scientific Session V- Contd.:Chair: Dr. K.Vishwanath & Dr. Larry Benjamin	
15 mins	Status of DR and interventions in Karnataka, Retina Institute, Bangalore	Dr. K.P.Pavan
15 mins	Clinical services and screening programs for DR in NorthEast:SDN, Guwahati	Dr. H. Bhattacharya
15 mins	DR Screening in Western India: Tulsi Eye Trust experience	Dr. Amol Wankhede
15 mins	DR Screening in a South Indian urban setting	Mr. S.Vishwanathan
15 mins	Experience with DR screening in Orissa: JPM Rotary Project	Dr. S. Mohapatra
14.45-15.45	Scientific Session VI: Cost Effectiveness, Utility and Frequency of Screening: Chair: Dr Clare Gilbert & Daksha Patel	
15 mins	Costing Screening services and cost utility and effectiveness of DR screening	K.Anand
10 mins	DR among self reported diabetics in South India	R.D.Thulasiraj
10 mins	How can the community participate in DR programs	Praveen Vashist
15 mins	Findings from Madras CURES Study: Prevalence of DR & risk factors	Dr Rema Mohan
10 mins	<i>Discussion</i>	
15.45– 16.00	TEA	
16.00– 17.30	Scientific Session VI: Research Needs and Support of INGOs for Diabetic Retinopathy: Chair: Dr R.S.Dhaliwal & Dr. Anand	
10 mins	ICMR: Research priorities for diabetic retinopathy	Dr. R.S.Dhaliwal
10 mins	Vision2020:India: Support for control of blindness due to diabetic retinopathy	Dr. P.K.M.Swamy
10 mins	Lions SightFirst: Diabetic retinopathy research program	Dr. C.S.Shetty
10 mins	Sight Savers India: initiatives for screening for diabetic retinopathy	Ms. Elizabeth Kurian
10 mins	OEU: Programs in India and Research Priorities	Dr. Santosh Moses
10 mins	Facilities available for managing DR in India: A pilot mapping	Dr. R.V.Azad
10 mins	DR screening and awareness generation using a group practice model	Dr. M.Patwardhan
10 mins	Round up of day's proceedings and outline of group work for next day	Clare Gilbert

28th March 2007

	Group Work-1	
09.00 – 11.00	Brainstorming to identify research and program priorities in India	
11.00 – 11.15	TEA	
	Group Work- 1 Contd.	
11.15 – 13.00		
13.00 – 13.30	LUNCH	
13.30 –14.45	Presentation of Group Task	
14.45 – 15.15	Identification of Groups for specific priority areas	Clare Gilbert
15.15 – 15.30	COFFEE	
15.30 – 17.00	Group Work - 2	

29th March 2007

9.00 -11.00	Group Work-2 Contd.	
11.00-11.15	Tea	
11.15-12.30	Presentation of Group Work-2	
12.30 – 13.00	Identification of Tasks for Group Work-3	Clare Gilbert
13.00-13.45	Lunch	
13.45 – 15.30	Group Work-3	
15.30 – 15.45	Coffee	
15.45 – 16.45	Presentation of Group Work-3	
16.45 – 17.00	Round up of day's proceedings and outline of group work for next day	Clare Gilbert

30th March 2007

09.00-11.00	Finalization of Operational and Epidemiological Research Protocols for Elimination of Avoidable Blindness due to DR in India	
11.00 – 11.30	Tea	
11.30 – 12.30	Presentation and Discussion	
12.30 – 13.00	Valedictory Session: Chairperson: Dr. R.Jose	
	Conclusions and Recommendations	Daksha Patel
	Follow Up Action and Future Course of Action	Clare Gilbert
	Evaluation of the Workshop	Ms Neena John
	Remarks on the Workshop	Dr. Praveen Vashist
	Vote of Thanks	Ms. Tanuja Joshi

APPENDIX 3. Summary of information needs identified by participants to improve programmes for diabetic retinopathy

1. Need in the population:

- Prevalence higher in urban than rural populations (overall 12% in ≥ 20 year olds) but gaps in data
- >30% of diabetics are undiagnosed
- Proportion of diabetics having retinopathy (population based) also varies – overall approx 10%
- The incidence of diabetes and diabetic retinopathy is not known

Topic for group work: Studies on the incidence and risk factors for diabetes and diabetic retinopathy

2. Awareness:

- Lack of awareness among communities and service providers about diabetes and its complications
- What is the most effective health education strategy?

Topics for group work:

- Evaluation of health education strategies with respect to diabetes and diabetic retinopathy
- Role of community groups / self help groups in control of diabetes and uptake of screening and treatment

3. Screening models currently being implemented:

Issues to be addressed in considering the different models:

- How can programmes for diabetic retinopathy be integrated into the health care system e.g. should mass screening and opportunistic approaches (e.g. in diabetic clinics; through Vision Centres) both be considered (coverage)?
- Should screening diabetics be a "stand alone" activity or integrated into routine eye camps? What are advantages and disadvantages?
- What is the best way of identifying diabetics to be examined (screening to identify diabetes; use existing registers; create new registers)?
- What is the optimal screening test for each approach (feasibility; acceptability; validity; cost effectiveness). ?
- What grading system should be used for the different approaches?
- How can uptake of referral for diagnosis and treatment be increased?
- How can the programme be ongoing, with regular, repeated eye examinations and what should the screening interval be?
- What information is needed for monitoring and evaluating programmes, and how should this information be captured?

Topics for group work:

a. Guidelines for establishing, implementing, managing and evaluating:

- Mass screening in the community
- Opportunistic screening in diabetic clinics
- + Detection of diabetic retinopathy in eye units

b. Studies of the cost effectiveness of the different approaches

c. Guidelines on training in image grading

d. Clinical trial of the cost effectiveness of different approaches to screening

4. Treatment:

- What is the best way of investigating and treating diabetic retinopathy?
- What is the cost of laser treatment and VR surgery, for reimbursement

Topics for group work:

Evidence based guidelines for:

- the investigation and treatment of the different types of diabetic retinopathy
- minimal essential equipment needed at tertiary, secondary and primary levels
- personnel needed at tertiary and secondary levels

5. Training of ophthalmologists:

- Should long and short term training fellowships be standardised?
- How can the number trained be increased?
- Do all residency programmes adequately address diabetes and diabetic retinopathy, and if not how can this be improved?
- Is undergraduate training up to date with respect to diabetes and its complications?
- How can the need for Continuing Professional Education be met?

Topics for group work:

Recommendations for training ophthalmologists:

- Short and long term fellowships in medical retina (from selection criteria for training through to assessment of trainees, evaluation of training and post training support)
- Minimal essential requirements for training institutions

6. Training of mid level personnel:

- How can the number trained be increased?
- Do all training programmes adequately address diabetes and diabetic retinopathy, and if not how can this be improved?
- How can the need for Continuing Professional Education be met?

Topics for group work:

Recommendations for training mid level personnel including minimal essential requirements for training institutions

7. Services available for diagnosis and treatment:

- Many States have inadequate trained personnel, infrastructure and equipment for investigating and managing diabetic retinopathy
- What is the situation across the country?

Topics for group work:

Development of an instrument and methodology for undertaking a situation analysis and mapping services available for investigating and managing diabetic retinopathy at tertiary and secondary levels across India